It may also be of interest to state that on the 21st inst. I observed a bright meteor to shoot in a path from near the Pole Star to Capella, vanishing near the latter after discharging a brilliant light-green flash.

From Ilfracombe the view to the north commands an extensive range of the sea horizon.

ERAS. OMMANNEY, Rear-Admiral

Ilfracombe, Devon

Natural History Museums

WHILE admiring and agreeing with the main features of Dr. P. L. Sclater's plan for the exhibition of the National Natural History collections in the new Museum at Kensington, I must beg to be allowed to enter a protest with regard to the geological portion of the scheme, which was all but completely overlooked by those who took part in the discussion of his suggestions and by Dr. Sclater himself.

The only words which Dr. Sclater devoted to the subject were to the effect that the palæontological collections should be merged into the general zoological and botanical ones. This arrangement is, however, one which will not serve the purpose of the geologist. We can fancy the utter misery of the man who wishes to study the fossils of some special formation, when he finds that to do so he will have to rush from case to case, amid stuffed and spirit specimens of all kinds, all over the place. The naturalists who deplore the loss of time incurred by them under the present order of things at the British Museum, have no thought for the geologist whom their proposed arrangement would condemn to far worse wandering in the new building. But in this particular I, as a geologist, sincerely trust that the project will not be carried out without some revision, and that a palæontological collection, quite independent of any other, and arranged *stratigraphically*, will form a by no means inconspicuous part of the Museum. The advantages of this system may be seen at a glance in Jermyn Street, where the British fossils are thus arranged.

In a collection as large as that of the National Museum must be, it may very likely be found impossible to exhibit specimens of every species in the show cases, and indeed it is by no means desirable that this should be done. It would be quite sufficient, and as far as the general public is concerned infinitely better, to limit the *exhibited* specimens to those belonging to species characteristic of each formation, and to keep all others, which would interest students only, in a cabinet drawer, where they would be at once handy to the specialist and not wearying to the sight-seer. Duplicates enough could doubtless be spared to complete the zoological and botanical series in the lower galleries, but unique and rare specimens should, to my mind, most decidedly be kept for the geological series. In conjunction with the latter, it would be highly desirable to establish a lithological collection, the absence of which, with the solitary exception of the small one in the Geological Museum, is every day more and more to be wondered at in such a country as ours.

Not only should appropriate rock-specimens accompany the fossils of each fossiliferous bed, but they should be so arranged that the organisms and the matrix in which they are found embedded, could be examined side by side. Typical examples of unfossiliferous strata should be placed in their regular order of succession, including specimens of contemporaneous rocks from other parts of the world. Clear geological sketch-maps, boldly coloured and not over-burdened with names, showing the distribution (so far as it is known) of the various equivalent groups of beds, should be placed in conspicuous places at intervals in the room or gallery, and thus, or in some closely-resembling manner, could a homogeneous whole be arrived at, combining the greatest amount of instruction to the public and the greatest convenience to the student.

Of course the geological collection shadowed forth above would by no means take the place of another more detailed lithological collection, which should, if possible, be added to the mineralogical one, containing all the igneous rocks, &c., and, like the minerals, arranged *chemically*.

G. A. LEBOUR, F.G.S. &c.,
of the Geological Survey of England.

Changes of Level at Pozzuoli, referred to in the "Apocryphal Acts of Peter and Paul"

IN the well-known description which Sir Charles Lyell gives of the changes of level of the shores of the Bay of Baiæ in the 30th chapter of his "Principles of Geology," there occur at pages 172-174 (vol ii. 10th edition) the following statements.

Speaking of the so-called "Temple of Serapis," and its adornment by the Emperor Alexander Severus between A.D. 222 and 235, he says: "From that era *there is an entire dearth of historical information for a period of* 12 *centuries*, except the significant fact that Alaric and his Goths sacked Pozzuoli in 410, and that Genseric did the like in 440 A.D." Again: "The period of deep submergence was certainly antecedent to the close of the 15th century"—a statement which he goes on to prove by a quotation from Loffredo referring to the year 1530, and a reference to documents cited by A. di Joris, one of which, dated 1503, speaks of land "where the sea is drying up."

Still more recently Professor Phillips, in his interesting volume on Vesuvius, speaking (p. 244) of the "Temple of Serapis," observes that, at the time of its adornment by the Emperor, "early in the 3rd century, it must have been in its original, or else in its second stage—perhaps we may adopt the latter view—there may have been a depression of 5ft., a new floor, restoration, and adornment. Nothing is absolutely known of any further change of level till the early part of the 16th century."

Thus both the authorities cited appear to agree that from the middle of the 3rd to the end of the 15th century there is a *total* absence of information. You may therefore possibly think that the following extract from the "Apocryphal Acts of Peter and Paul" possesses some interest, even though it may be difficult to agree on the approximate date of the writer. Your columns would scarcely be the place, nor am I competent, to discuss this last point, but as one of the MSS. collected by Professor Tischendorf for his edition of the Greek original is said to be of the end of the 9th century, it appears to me that we have here not only a rather quaint explanation of the immediate cause of the changes of level of the land at Pozzuoli and in its neighbourhood, but a distinct reference *at least* to six centuries before the Italian writers already quoted, not merely to the fact, but also to the extent, of the movement in question. Notwithstanding its suspicious legendary framework, the statement that "Pontiole sunk into the sea-shore about one fathom; and *there it is until this day*, for a remembrance, under the sea," has an air of *vraisemblance*, a ring of truthfulness, about it which I hope will justify my bringing the matter under the notice of those so much more competent than I am to assign to it its true value, and to whom it may possibly be new.

I quote from the translation by Mr. A. Walker, forming a portion of Vol. xvi. of the "Ante-Nicene Library," published by Messrs. Clark of Edinburgh, pp. 257-8.

F. FOX TUCKETT

Frenchay, near Bristol, Oct. 3

"And when Paul came out of Mesina he sailed to Didymus, and remained there one night, and having sailed thence, he came to Pontiole (Puteoli) on the second day. And Dioscorus the shipmaster, who brought him to Syracuse, sympathising with Paul because he had delivered his son from death, having left his own ship in Syracuse, accompanied him to Pontiole. And some of Peter's disciples having been found there, and having received Paul, exhorted him to stay with them. And he stayed a week in hiding, because of the command of Cæsar (that he should be put to death). And all the toparchs were watching to seize and kill him. But Dioscorus the shipmaster, being himself bald, wearing his shipmaster's dress, and speaking boldly, on the first day went into the city of Pontiole. Thinking, therefore, that he was Paul, they seized him and beheaded him, and sent his head to Cæsar. . . . .

"And Paul, being in Pontiole, and having heard that Dioscorus had been beheaded, being grieved with great grief, gazing into the height of the heaven, said: 'O Lord Almighty in Heaven, who has appeared to me in every place whither I have gone on account of Thine only begotten Word, our Lord Jesus Christ, punish this city, and bring out all who have believed in God and followed His Word.' He said to them, therefore, 'Follow me.' And going forth from Pontiole with those who had believed in the Word of God, they came to a place called Baias (Baiæ), and looking up with their eyes, they all see that city called Pontiole sink into the sea-shore about one fathom, *and there it is until this day, for a remembrance, under the sea*.

"And those who had been saved out of the city of Pontiole, that had been swallowed up, reported to Cæsar in Rome that Pontiole had been swallowed up with all its multitude."

Hereditary Deformities

IN the number of NATURE for Sept. 3, a letter from Mr. William Field appears with the title "Hereditary Deformities,'

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commenting on certain alleged facts quoted in an ethnological article in *Cassell's Popular Educator*, from Dr. Theodor Waitz's "Introduction to Anthropology," translated by Mr. Collingwood. Mr. Field justly remarks that facts of such a character, "if substantiated, would introduce *Accidental Distortion* as a co-worker with Natural Selection in the modification of species." But he puts the question—"Do these stories rest on a good foundation?" Personally, I do not know. All I can say is, that Dr. Waitz, whose scientific authority is unimpeachable, published them without expressing any doubts of their accuracy. They may be found with some alleged facts of analogous character, at pp. 83 to 85 of his first volume, as translated by Mr. Collingwood. Speaking of animals, he says:—

"Mutilations also are sometimes transmitted. Williamson* saw in Carolina dogs which have been deficient in tails for three or four generations, in consequence of one of their ancestors having accidentally lost it. A cow, three years old, which had lost by suppuration her left horn, produced three calves, which, instead of the left horn, presented only a small protuberance on the skin. Dogs and horses whose tails or ears are clipped, as the draught dogs in Kamtschatka, often transmit these deficiencies to their offspring." (p. 83.)

Referring next to man, he considers that there are "cases in which deformities have shown themselves hereditary" (p. 84.) He says:—

"Instances of hereditary blindness and deafness, and of alternating dumbness, so that every second or third child was deaf, are given by Lucas. Harris communicates a case of hereditary blindness in one eye, and of a double thumb on the right hand."

I omit other instances. He continues again:—

"Instances are not wanting of mutilations that have been transmitted from parents to children; such, however, occur less frequently. According to Blumenbach, the children of an officer, whose little finger had been cut across and become crooked, possessed an analogous defect. Gosse cites the case of an officer wounded in the battle of Eylau, who transmitted to his offspring a scar on the forehead. Other instances of hereditary deformities are found in Wagner" (p. 85).

As Waitz, it will be perceived, quotes Blumenbach, it may be mentioned that the last-named author has a paragraph headed, "Problem proposed. Can mutilations and other artifices give commencement of native varieties of animals?" After showing that some have answered the question in the affirmative and others in the negative, he adds, "I have not at present adopted as my own either the affirmative or negative of these opinions." See p. 203 of his Anthropological Treatises, translated by Mr. Bendyside.

New facts, capable of being severely tested, would be of great value.

THE WRITER OF THE ETHNOLOGICAL PAPERS
IN "CASSELL'S POPULAR EDUCATOR"

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[*] More specific reference to the authorities on which Waitz rested may be found in the foot-notes to his work. Some of the volumes he quotes are foreign, and not to be found in the British Museum Library.

The Stability of Turret Ships

SINCE the loss of the *Captain* an opinion has rapidly gained ground, not only amongst unscientific men, but even amongst those who from their education should have acquired some of the most simple laws of statics, that that noble ship toppled over on account of her being "top-heavy"—that the *Captain*, an armour-plated ship with a low freeboard, was more "top-heavy" than a broadside ship, with more than twice as much out of water! The fact is, that her weights were lower and not higher than those of other vessels, and therefore that her fault was not "top-heaviness."

In looking at the stability of a vessel we take two points—the "centre of gravity" and the "centre of buoyancy;" the former being a certain point at which, if the attraction of gravity impressed a single force equal in intensity to the sum of all its separate actions on the component parts of the body, the ultimate effect would be the same as it is under the system of separate actions which really exists. The latter is the centre of gravity of the volume of water displaced by the ship, and may be regarded as the pivot on which she would turn on heeling over. The vessel being in a vertical position, the centre of gravity is immediately over the centre of buoyancy, and she is in a state of unstable equilibrium, *i.e.* she is in the same fix as a walking-stick standing on end. So far in favour of "top-heaviness."

Suppose now that she heels over to one side, what will the effect on our centres be? Immediately she begins to heel over the centre of buoyancy travels outwards to the side towards which she heels, and the centre of gravity being fixed, there will come a point when it will exert a force to overcome the heeling over pressure. This travelling outwards of the centre of buoyancy depends wholly on the shape of the vessel, and will appear perfectly plain by drawing sketches of a ship lying at different angles. The more a vessel heels over, the further outwards does the centre of buoyancy travel, and the greater is the resistance offered to the heeling over pressure until she approaches a certain point, then the centre of buoyancy moves out at an increasingly slower rate, and finally reaches the position corresponding to that of her maximum statical stability.

Before this, if by any disturbing cause, such as the alteration of the wave slope, the ship were inclined beyond her position of maximum stability, the resistance to heeling would become less the farther she went, until she reached a position at which her moment of stability would be the same as before the disturbing force began to act. And in this position she would remain in unstable equilibrium if the disturbing forces were removed. But if she should pass this position before the disturbing forces, and the angular velocity caused by them, cease, the ordinary movement of the heeling over force would then be greater than the resistance offered by the stability, in any position through which she would pass, and she would be turned over.

Now the difference between a high and a low freeboard ship as regards stability under sail is this:—The position of maximum stability is reached soon after the immersion of the edge of the deck; and as a high freeboard ship does not immerse her deck until she has attained a large inclination, while a ship of low freeboard will immerse hers at a very much less angle, it follows that, in the latter case, the position of maximum stability and then of unstable equilibrium is reached at a comparatively small angle of heel, and a ship of this construction is much more likely to be capsized than one with a high freeboard. Of course, in a low-sided ship, the centre of gravity may be brought so low as always to be on the right side of the centre of buoyancy, but this is not practicable in an armour-plated turret ship.

From what we have here stated it will be seen that the error in design that made the *Captain* so much heavier than was expected, and draw six feet instead of eight, was not adding so much to her stability but was in reality lessening it, and, perhaps, was the cause of her loss; and that if we are to have armour-plated turret ships, they must either be built of low freeboard, to be propelled by steam alone, or of high freeboard sufficient to give stability for sails.

The feud between naval architects and the advocates of the turret system has been going on for ten years back—the former contending that a high side was necessary in a rigged sailing ship, and the latter, that if they put their guns in turrets, they could have low-sided ships, or, in fact, ships with no sides at all, after a certain amount of inclination.

That the loss of the *Captain* has resulted from a preventible cause is quite evident, and we have shown what that cause is; it, therefore, only remains that if we are to have sailing turret ships, we must have high freeboard for the sake of stability.

T. BELL LIGHTFOOT

Newcastle-upon-Tyne

The New Postal Act

AT page 474 Mr. Reeks complains as to the working of the new Postal Act. It seems intended to obliterate the old parcel post. He says, "Herbarium specimens are not excluded." Perhaps so; but they are not included. The provisions of the new Act are limited to books, written and printed matter, genuine trade samples and patterns, so far as regards the two ounces for a halfpenny. All parcels other than books, &c., as described above, go at the letter rate of one penny for each half-ounce.

The postal card is the thin end of the wedge that will hereafter open to us a regular letter rate of a quarter of an ounce for a halfpenny. For instance: we may now send ordinary business communications up to two ounces, thus embodying the matter of twenty postal cards, for the halfpenny, if folded in a paper wrapper. An ordinary business communication of half-ounce weight goes for the halfpenny, if folded as a letter but left unsealed.

I ask, If Government will now take an open letter for a halfpenny, why not take it closed at the same rate? Common sense

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